
**LONG-TERM GROUNDWATER MONITORING REPORT
SECOND ROUND (December 2001)**

**BLACKWELL FOREST PRESERVE LANDFILL SITE
DUPAGE COUNTY, ILLINOIS**

MWH File No.: 2090045

Prepared For:

**Forest Preserve District
DuPage County, Illinois**

Prepared By:

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January 2002

EPA Region 5 Records Ctr.



228948



MWH

MONTGOMERY WATSON HARZA

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Prepared by:

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ACRONYMS AND ABBREVIATIONS

FPD	Forest Preserve District of DuPage County
IEPA	Illinois Environmental Protection Agency
MCLs	Maximum Contaminant Levels
QAPP	Quality Assurance Project Plan
QC	Quality Control
ORP	Oxidation-Reduction Potential
RI/FS	Remedial Investigation/Feasibility Study
Site	Blackwell Landfill Site
TCL	Target Compound List
TDS	Total Dissolved Solids
VOCs	Volatile Organic Compounds
U.S. EPA	United States Environmental Protection Agency

1.0 INTRODUCTION

This report documents the results of the second round of long-term groundwater monitoring conducted in December 2001 at the Forest Preserve District of DuPage County (FPD) Blackwell Landfill Site (Site). The groundwater monitoring was conducted in accordance with the January 8, 2001 Revised Long-Term Groundwater Monitoring Program Report, which was approved by the United States Environmental Protection Agency (U.S. EPA) in a January 22, 2001 letter. The Blackwell Landfill is located within the Blackwell Forest Preserve in Warrenville, DuPage County, Illinois (Figure 1). General Site features are shown in Figure 2.

2.0 SCOPE OF MONITORING PROGRAM

The purpose of the long-term groundwater monitoring program, as outlined in the Revised Long-Term Groundwater Monitoring Program Report, is to:

- Ensure that contaminant levels in groundwater do not increase to a level that could jeopardize either human health or the environment;
- Evaluate the effectiveness of the treatment/containment components on the landfill;
- Detect changes in chemical composition in groundwater at and adjacent to the Site; and
- Demonstrate that natural attenuation is continuing to be an effective remedial strategy for impacted groundwater.

The long-term groundwater monitoring program consists of groundwater level measurements, and groundwater sampling and analyses. Twenty-six monitoring wells are included in the long-term monitoring program, which are divided into:

- Detection monitoring wells, located between the landfill and the downgradient Site boundary;
- Compliance monitoring wells, located along the downgradient Site boundary; and
- Other monitoring wells/piezometers for water level measurement only.

The rationale for including these wells in the groundwater monitoring program is discussed in the Revised Long-Term Groundwater Monitoring Program Report.

The monitoring wells are further grouped into those screened in the upper, glacial outwash aquifer (Figure 3) and those screened in the lower, limestone bedrock aquifer (Figure 4). The 26 wells are listed below in these groupings:

Detection Monitoring Wells

Glacial Outwash Aquifer Wells

G117	G127
G118S	G129
G126	G130

Bedrock Wells

G128D	G140D
-------	-------

Compliance Monitoring Wells

Glacial Outwash Aquifer Wells

G122 G147*

Bedrock Wells

G133D G138

** New monitoring well installed in March 2001 at the request of the U.S. EPA.*

Water Level Wells

Glacial Outwash Aquifer Wells

P2 G133S

G107S G142

G114 G143

G121 G144

G123

Bedrock Wells

G132D G137

G134 G139

G135

Groundwater samples collected from the Detection and Compliance monitoring wells are to be analyzed for the parameters of concern on a nine-month schedule. This schedule will permit demonstration of seasonal effects on groundwater quality, if any, since groundwater samples will be collected in each of the four seasons over a three-year period. The schedule for the first five rounds of the long-term monitoring program is shown below. Following the fifth sampling event, the FPD will evaluate the groundwater results and recommend possible modifications, if any, to the groundwater monitoring program.

Long-Term Monitoring Round	Sampling Period
First	March 2001
Second	December 2001
Third	September 2002
Fourth	June 2003
Fifth	March 2004

The groundwater samples are to be analyzed for volatile organic compounds (VOCs) on the Target Compound List (TCL), phenol, and for water quality parameters (i.e., chloride, sulfate and total dissolved solids (TDS)). However, new monitoring well G147 may only be sampled twice for VOCs according to the schedule provided above. Monitoring well G147 will not be sampled again if VOCs are not detected in the first two rounds of collected groundwater samples.

3.0 SUMMARY OF FIELD ACTIVITIES

3.1 GROUNDWATER SAMPLING

Groundwater samples were collected from the Detection and Compliance monitoring wells from December 11 through December 13, 2001. The samples were collected in accordance with procedures described in the U.S. EPA approved Revised Pre-Design Investigation Activities report, Appendix F (July 1997) and all subsequent and approved addenda. The samples were analyzed and validated in accordance with the Quality Assurance Project Plan (QAPP, Volume IV of the Pre-Design Investigation Activities Report, August 1996). These procedures are summarized below:

- Static water levels were measured at each monitoring well (Table 1).
- Water elevations of nearby surface water bodies (i.e., Silver Lake, Pine Lake, Sand Pond, two locations along Spring Brook and one location on the west branch of the DuPage River) (Table 1) were measured by a licensed, professional surveyor on December 10, 2001.
- All monitoring wells were purged with a decontaminated, submersible GrundfosTM pump using low-flow methods. Dedicated tubing was used in each well. Wells were purged until field parameters (i.e., temperature, pH, specific conductivity, dissolved oxygen, oxidation-reduction potential (ORP), and turbidity) stabilized (Table 2).
- All monitoring wells were sampled from the pump discharge following purging. Samples for TDS analysis were filtered using an in-line, 0.45 micron membrane filter.
- Quality control (QC) samples (e.g., duplicates, field blanks, and matrix spike/matrix spike duplicates) were collected at frequencies specified in the QAPP.
- Following collection, the samples were placed in coolers and delivered under strict chain-of-custody to First Environmental Laboratories, Inc. in Naperville, Illinois for analysis.

3.2 ANALYTICAL RESULTS

The groundwater samples were analyzed by First Environmental Laboratories, Inc., of Naperville, Illinois for TCL VOCs, phenol, chloride, sulfate, and TDS. The samples were analyzed in accordance with the analytical methods and required practical quantitation limits outlined in the QAPP and in QAPP addenda. The laboratory-supplied data package was

reviewed and validated by MWH in accordance with the QAPP and EPA guidance. The validation report has been retained on file at MWH, and is available upon request.

The validated analytical results are summarized in Table 3. The U.S. EPA's Maximum Contaminant Levels (MCLs) and Illinois Environmental Protection Agency (IEPA) Class I Groundwater Standards (i.e., "regulatory standards") are also listed in Table 3 and exceedances of these standards are highlighted. A summary of detections, groundwater standards, and exceedances of standards is provided in Table 4.

The analytical data summarized in Tables 3 and 4 indicate that:

- One VOC was detected during the second round of long-term groundwater monitoring (i.e., cis-1,2-dichloroethene). Cis-1,2-dichloroethene was detected in groundwater samples from four Detection monitoring wells (i.e., G117, G118S, G126, and G127) located in the upper outwash aquifer. However, all detected concentrations of cis-1,2-dichloroethene were below regulatory standards.
- VOCs were not detected in new compliance well G147.
- TDS was detected in groundwater samples from 6 of the 12 Detection and Compliance wells at concentrations above the secondary MCL. While the maximum detected concentration was 822 mg/L in a sample from outwash Detection well G118S, the exceedances of TDS were distributed among three of the four classes of monitoring wells (i.e., shallow Detection, deep Detection, and deep Compliance).

3.3 COMPARISON TO HISTORIC ANALYTICAL RESULTS

MWH reviewed the historic analytical results obtained from Detection and Compliance monitoring wells during the Remedial Investigation and Feasibility Study (RI/FS) and previous rounds of quarterly groundwater monitoring to assess overall trends in the data and specific changes during the first round of long-term monitoring. The historic data was collected on the following dates:

- First and second round of the RI, 1991 through 1992;
- One round collected during the FS, 1995;
- Eight rounds collected during the Quarterly Groundwater Monitoring Program, 1997 through 2000; and
- One round collected during the Long-Term Groundwater Monitoring Program.

Review of this historic data and Table 4 indicates the following:

- The number of VOCs detected in groundwater samples is decreasing with time. For example, during the first round of the RI in September 1991, a total of seven VOCs were detected within nine monitoring wells. However, during this second round of long-term groundwater monitoring in December 2001, only one VOC (i.e., cis-1,2-dichloroethene) was detected within four outwash Detection wells.
- The concentrations of detected VOCs are also decreasing with time. For the VOC currently detected in the monitoring wells, the maximum detected concentration of 1,2-dichloroethene (total) was 120 ug/L in January 1992 during the second round of the RI. Currently, the maximum concentration of cis-1,2-dichloroethene detected during the second round of long-term sampling is 10.9 ug/L.
- The detected cis-1,2-dichloroethene concentrations in the four outwash Detection wells are consistent with historic results and do not represent a significant increase in VOC concentration as described in the Revised Long-Term Groundwater Monitoring Program.
- No VOCs were detected in new monitoring G147, marking the second round of long-term sampling where no VOCs were detected in this well. Therefore, in accordance with the U.S. EPA approved Revised Long-Term Groundwater Monitoring Program (Montgomery Watson, 2001), groundwater will no longer be sampled from G147. However, this well will be retained for possible use in future groundwater collection activities.
- Historically, the concentrations of TDS have generally exceeded their Secondary MCLs.

3.4 GROUNDWATER LEVEL MEASUREMENTS

Groundwater elevations were measured prior to groundwater monitoring on December 10, 2001. Surface water elevations were also measured on December 10, 2001. The groundwater and surface water elevations are summarized in Table 1.

3.4.1 Upper Aquifer - Glacial Outwash

The groundwater surface for the upper glacial outwash aquifer is presented on Figure 5. The approximate northern boundary of the glacial aquifer is within the southwest portion of the landfill. The direction of groundwater flow in the glacial aquifer is to the south/southwest. Groundwater flow and the relationship of surface water elevations to groundwater elevations are consistent with the groundwater flows defined in previous monitoring reports.

3.4.2 Lower Aquifer - Bedrock

The potentiometric surface for the lower aquifer is presented on Figure 6. The direction of groundwater flow is to the southwest, and is consistent with the groundwater flow defined in previous monitoring reports.

4.0 SUMMARY AND CONCLUSIONS

Water level measurements collected in December 2001 indicate that the groundwater flow system is similar to historical data. Groundwater in the upper aquifer near the landfill flows to the south and southwest towards the West Branch of the DuPage River. Groundwater flow in the lower aquifer is to the southwest.

The analytical results for the December 2001 sampling event of eight upper aquifer wells and four lower aquifer wells are consistent with past monitoring results, and continue to show a general trend of decreasing number of VOC analytes and decreasing VOC concentrations. During the current monitoring event, groundwater samples from four monitoring wells contained low levels of the VOC cis-1,2-dichloroethene at concentrations below U.S. EPA MCLs and IEPA Class I Groundwater Standards. For the second consecutive round of sampling, volatile organic compounds were not detected in new monitoring well G147. Therefore, in accordance with the Revised Long-Term Groundwater Monitoring Program (Montgomery Watson, 2001), monitoring well G147 will no longer be sampled.

The concentrations of TDS detected during the second round of long-term groundwater monitoring are consistent with previous sampling events, and continue to exceed U.S. EPA Secondary MCLs.

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Table 1
Summary of Groundwater Level Measurements (December 2001)
Blackwell Landfill, DuPage County, Illinois

Deep Monitoring Wells (Bedrock)

Well Designation	Depth to Water (feet)	TOIC Elevation (feet)	Groundwater Elevation (feet)	Notes
G128D	14.27	707.41	693.14	Detection Well
G133D	14.97	708.10	693.13	Compliance Well
G138	15.57	708.69	693.12	Compliance Well
G140D	12.46	705.71	693.25	Detection Well

Shallow Monitoring Wells (Glacial Outwash)

Well Designation	Depth to Water (feet)	TOIC Elevation (feet)	Groundwater Elevation (feet)	Notes
G117	13.73	707.44	693.71	Detection Well
G118S	16.57	711.33	694.76	Detection Well
G122	13.31	706.52	693.21	Compliance Well
G126	11.10	704.50	693.40	Detection Well
G127	13.00	706.66	693.66	Detection Well
G129	8.79	702.86	694.07	Detection Well
G130	15.57	710.40	694.83	Detection Well
G147	12.32	704.72	692.40	Compliance Well

Water Level Wells

Well Designation	Depth to Water (feet)	TOIC Elevation (feet)	Groundwater Elevation (feet)	Notes
P2	6.83	699.18	692.35	Glacial Outwash Aquifer Well
G107S	14.04	708.60	694.56	Glacial Outwash Aquifer Well
G114	15.30	709.40	694.10	Glacial Outwash Aquifer Well
G121	10.45	703.71	693.26	Glacial Outwash Aquifer Well
G123	14.11	707.77	693.66	Glacial Outwash Aquifer Well
G133S	14.77	708.04	693.27	Glacial Outwash Aquifer Well
G142	15.46	709.17	693.71	Glacial Outwash Aquifer Well
G143	12.68	706.56	693.88	Glacial Outwash Aquifer Well
G144	7.50	701.88	694.38	Glacial Outwash Aquifer Well
G132D	24.11	725.99	701.88	Bedrock Well
G134	25.91	727.20	701.29	Bedrock Well
G135	25.48	721.07	695.59	Bedrock Well
G137	8.89	701.89	693.00	Bedrock Well
G139	8.83	702.22	693.39	Bedrock Well

Surface Water

Measurement Location	Surface Water Elevation (feet)
Silver Lake	703.69
Pool West of Silver Lake	701.77
Sand Pond	693.29
Pine Lake	693.07
Spring Brook - No. 2	700.51
Spring Brook - No. 3	694.44
DuPage River	690.38

Notes:

Surface water levels were surveyed on December 10, 2001.

Groundwater levels were measured on December 10, 2001.

All depth and elevation measurements in units of feet.

TOIC = Top of inner casing

Table 2
Summary of Field Parameters⁽¹⁾ (December 2001)
Blackwell Landfill, DuPage County, Illinois

Deep Monitoring Wells (Bedrock)

Well Number	Type of Well	pH	Temperature (oC)	Dissolved Oxygen (mg/L)	Specific Conductivity (us/cm)	Turbidity (NTU)	Oxidation - Reduction Potential (mV)
G128D	Detection	7.07	11.87	0.29	59.1	41.3	-130
G133D	Compliance	7.08	11.00	0.31	79.5	16.4	-122
G138	Compliance	7.10	11.48	0.51	76.9	7.1	-88
G140D	Detection	7.00	11.37	0.65	81.8	5.6	-59

Shallow Monitoring Wells (Glacial Outwash)

Well Number	Type of Well	pH	Temperature (oC)	Dissolved Oxygen (mg/L)	Specific Conductivity (us/cm)	Turbidity (NTU)	Oxidation - Reduction Potential (mV)
G117	Detection	7.00	14.25	0.50	58.8	31.3	-105
G118S	Detection	6.46	13.30	0.91	100	14.2	-196
G122	Compliance	6.86	13.12	0.39	62.6	4.4	-174
G126	Detection	6.93	13.46	0.48	82.2	5.5	-106
G127	Detection	6.83	13.40	0.40	66.4	152.0	-209
G129	Detection	6.94	11.73	1.63	67.9	170.0	-5
G130	Detection	6.83	12.34	0.41	105	14.8	-35
G147	Compliance	7.40	15.33	3.13	39.7	19.0	14

Notes

(1) Stabilized field parameters.

°C - Degrees Celsius

mg/L - Milligrams per liter

us/cm - Microsiemens per centimeter

NTU - Nephelometric turbidity units

mV - Millivolts

Table 3
Validated Analytical Results
Round 2, Long-Term Groundwater Monitoring Program
Blackwell Landfill, DuPage County, Illinois

Parameter	Sample Date	EPA MCLs	IEPA Class I Standards	Units	BW-GW-FB01-10 12/11/01			BW-GW-FB02-10 12/13/01			BW-GW-G117-10 12/12/01			BW-GW-G118S-10 12/12/01			BW-GW-G122-10 12/11/01		
					Conc	LQ/DVQ	PQL	Conc	LQ/DVQ	PQL	Conc	LQ/DVQ	PQL	Conc	LQ/DVQ	PQL	Conc	LQ/DVQ	PQL
VOC																			
Acetone			700*	ug/L	13.5	/	10		U/	10		U/	10		U/	10		U/	10
Benzene		5	5	ug/L		U/	5		U/	5		U/	5		U/	5		U/	5
Bromodichloromethane		100/80 (THM)	0.02a	ug/L		U/	5		U/	5		U/	5		U/	5		U/	5
Bromoform		100/80 (THM)	0.2a	ug/L		U/	5		U/	5		U/	5		U/	5		U/	5
Bromomethane (Methyl bromide)			9.8*	ug/L		U/	10		U/	10		U/	10		U/	10		U/	10
2-Butanone (MEK)				ug/L		U/	10		U/	10		U/	10		U/	10		U/	10
Carbon disulfide			700*	ug/L		U/	5		U/	5		U/	5		U/	5		U/	5
Carbon tetrachloride		5	5	ug/L		U/	5		U/	5		U/	5		U/	5		U/	5
Chlorobenzene (Monochlorobenzene)		100	100	ug/L		U/	5		U/	5		U/	5		U/	5		U/	5
Chlorodibromomethane		100/80 (THM)	140*	ug/L		U/	5		U/	5		U/	5		U/	5		U/	5
Chloroethane				ug/L		U/	10		U/	10		U/	10		U/	10		U/	10
Chloroform		100/80 (THM)	0.02a	ug/L		U/	5		U/	5		U/	5		U/	5		U/	5
Chloromethane				ug/L		U/	10		U/	10		U/	10		U/	10		U/	10
1,1-Dichloroethane			700*	ug/L		U/	5		U/	5		U/	5		U/	5		U/	5
1,2-Dichloroethane		5	5	ug/L		U/	5		U/	5		U/	5		U/	5		U/	5
1,1-Dichloroethene		7	7	ug/L		U/	5		U/	5		U/	5		U/	5		U/	5
cis-1,2-Dichloroethene		70	70	ug/L		U/	5		U/	5	5.1	/	5	10.9	/	5		U/	5
trans-1,2-Dichloroethene		100	100	ug/L		U/	5		U/	5		U/	5		U/	5		U/	5
1,2-Dichloropropane		5	5	ug/L		U/	5		U/	5		U/	5		U/	5		U/	5
cis-1,3-Dichloropropene			1a (cis + trans)	ug/L		U/	5		U/	5		U/	5		U/	5		U/	5
trans-1,3-Dichloropropene				ug/L		U/	5		U/	5		U/	5		U/	5		U/	5
Ethyl benzene		700	700	ug/L		U/	5		U/	5		U/	5		U/	5		U/	5
2-Hexanone (MBK)				ug/L		U/	10		U/	10		U/	10		U/	10		U/	10
4-Methyl-2-pentanone (MIBK)				ug/L		U/	10		U/	10		U/	10		U/	10		U/	10
Methylene chloride		5	5	ug/L		U/	5		U/	5		U/	5		U/	5		U/	5
Styrene		100	100	ug/L		U/	5		U/	5		U/	5		U/	5		U/	5
1,1,2,2-Tetrachloroethane				ug/L		U/	5		U/	5		U/	5		U/	5		U/	5
Tetrachloroethene		5	5	ug/L		U/	5		U/	5		U/	5		U/	5		U/	5
Toluene		1000	1000	ug/L		U/	5		U/	5		U/	5		U/	5		U/	5
1,1,1-Trichloroethane		200	200	ug/L		U/	5		U/	5		U/	5		U/	5		U/	5
1,1,2-Trichloroethane		5	5	ug/L		U/	5		U/	5		U/	5		U/	5		U/	5
Trichloroethene		5	5	ug/L		U/	5		U/	5		U/	5		U/	5		U/	5
Vinyl Acetate			7000*	ug/L		U/	10		U/	10		U/	10		U/	10		U/	10
Vinyl Chloride		2	2	ug/L		U/	2		U/	2		U/	2		U/	2		U/	2
m-Xylene				ug/L		U/	5		U/	5		U/	5		U/	5		U/	5
o-Xylene				ug/L		U/	5		U/	5		U/	5		U/	5		U/	5
p-Xylene				ug/L		U/	5		U/	5		U/	5		U/	5		U/	5
SVOC																			
Phenol			100	mg/L		U/	0.01		U/	0.01		U/	0.01		U/	0.01		U/	0.01
Inorganic																			
Chloride		250**	200	mg/L		U/	5		U/	5	24	/	5	5	/	5	15	/	5
Sulfate		500	400	mg/L		U/	15		U/	15	52	/	15	191	/	15	69	/	15
Total Dissolved Solids		500**	1200	mg/L		U/	10		U/	10	404	/	10		/	10	469	/	10

Table 3
Validated Analytical Results
Round 2, Long-Term Groundwater Monitoring Program
Blackwell Landfill, DuPage County, Illinois

Parameter	Sample Date	EPA MCLs	IEPA Class 1 Standards	Units	BW-GW-G126-10 12/13/01			BW-GW-G127-10 12/12/01			BW-GW-G127-910 12/12/01			BW-GW-G128D-10 12/11/01			BW-GW-G129-10 12/12/01		
					Conc	LQ/DVQ	PQL	Conc	LQ/DVQ	PQL	Conc	LQ/DVQ	PQL	Conc	LQ/DVQ	PQL	Conc	LQ/DVQ	PQL
VOC																			
Acetone			700*	ug/L		U/	10		U/	10		U/	10		U/	10		U/	10
Benzene		5	5	ug/L		U/	5		U/	5		U/	5		U/	5		U/	5
Bromodichloromethane		100/80 (THM)	0.02a	ug/L		U/	5		U/	5		U/	5		U/	5		U/	5
Bromoform		100/80 (THM)	0.2a	ug/L		U/	5		U/	5		U/	5		U/	5		U/	5
Bromomethane (Methyl bromide)			9.8*	ug/L		U/	10		U/	10		U/	10		U/	10		U/	10
2-Butanone (MEK)				ug/L		U/	10		U/	10		U/	10		U/	10		U/	10
Carbon disulfide			700*	ug/L		U/	5		U/	5		U/	5		U/	5		U/	5
Carbon tetrachloride		5	5	ug/L		U/	5		U/	5		U/	5		U/	5		U/	5
Chlorobenzene (Monochlorobenzene)		100	100	ug/L		U/	5		U/	5		U/	5		U/	5		U/	5
Chlorodibromomethane		100/80 (THM)	140*	ug/L		U/	5		U/	5		U/	5		U/	5		U/	5
Chloroethane				ug/L		U/	10		U/	10		U/	10		U/	10		U/	10
Chloroform		100/80 (THM)	0.02a	ug/L		U/	5		U/	5		U/	5		U/	5		U/	5
Chloromethane				ug/L		U/	10		U/	10		U/	10		U/	10		U/	10
1,1-Dichloroethane			700*	ug/L		U/	5		U/	5		U/	5		U/	5		U/	5
1,2-Dichloroethane		5	5	ug/L		U/	5		U/	5		U/	5		U/	5		U/	5
1,1-Dichloroethene		7	7	ug/L		U/	5		U/	5		U/	5		U/	5		U/	5
cis-1,2-Dichloroethene		70	70	ug/L	7.6	/	5	9.4	/	5	8.7	/	5		U/	5		U/	5
trans-1,2-Dichloroethene		100	100	ug/L		U/	5		U/	5		U/	5		U/	5		U/	5
1,2-Dichloropropane		5	5	ug/L		U/	5		U/	5		U/	5		U/	5		U/	5
cis-1,3-Dichloropropene			1a (cis + trans)	ug/L		U/	5		U/	5		U/	5		U/	5		U/	5
trans-1,3-Dichloropropene				ug/L		U/	5		U/	5		U/	5		U/	5		U/	5
Ethyl benzene		700	700	ug/L		U/	5		U/	5		U/	5		U/	5		U/	5
2-Hexanone (MBK)				ug/L		U/	10		U/	10		U/	10		U/	10		U/	10
4-Methyl-2-pentanone (MIBK)				ug/L		U/	10		U/	10		U/	10		U/	10		U/	10
Methylene chloride		5	5	ug/L		U/	5		U/	5		U/	5		U/	5		U/	5
Styrene		100	100	ug/L		U/	5		U/	5		U/	5		U/	5		U/	5
1,1,2,2-Tetrachloroethane				ug/L		U/	5		U/	5		U/	5		U/	5		U/	5
Tetrachloroethene		5	5	ug/L		U/	5		U/	5		U/	5		U/	5		U/	5
Toluene		1000	1000	ug/L		U/	5		U/	5		U/	5		U/	5		U/	5
1,1,1-Trichloroethane		200	200	ug/L		U/	5		U/	5		U/	5		U/	5		U/	5
1,1,2-Trichloroethane		5	5	ug/L		U/	5		U/	5		U/	5		U/	5		U/	5
Trichloroethene		5	5	ug/L		U/	5		U/	5		U/	5		U/	5		U/	5
Vinyl Acetate			7000*	ug/L		U/	10		U/	10		U/	10		U/	10		U/	10
Vinyl Chloride		2	2	ug/L		U/	2		U/	2		U/	2		U/	2		U/	2
m-Xylene				ug/L		U/	5		U/	5		U/	5		U/	5		U/	5
o-Xylene				ug/L		U/	5		U/	5		U/	5		U/	5		U/	5
p-Xylene				ug/L		U/	5		U/	5		U/	5		U/	5		U/	5
SVOC																			
Phenol			100	mg/L		U/	0.01		U/	0.01		U/	0.01		U/	0.01		U/	0.01
Inorganic																			
Chloride		250**	200	mg/L	82	/	5	37	/	5	40	/	5	25	/	5	47	/	5
Sulfate		500	400	mg/L	63	/	15	62	/	15	63	/	15	53	/	15	85	/	15
Total Dissolved Solids		500**	1200	mg/L	468	/	10	468	/	10	469	/	10	424	/	10	498	/	10

Table 3
Validated Analytical Results
Round 2, Long-Term Groundwater Monitoring Program
Blackwell Landfill, DuPage County, Illinois

Parameter	Sample Date	EPA MCLs	IEPA Class I Standards	Units	BW-GW-G130-10 12/12/01			BW-GW-G133D-10 12/11/01			BW-GW-G138-10 12/11/01			BW-GW-G140D-10 12/11/01			BW-GW-G147-10 12/11/01		
					Conc	LQ/DVQ	PQL	Conc	LQ/DVQ	PQL	Conc	LQ/DVQ	PQL	Conc	LQ/DVQ	PQL	Conc	LQ/DVQ	PQL
VOC																			
Acetone			700*	ug/L	U/	10		U/	10		U/	10		U/	10		U/	10	
Benzene		5	5	ug/L	U/	5		U/	5		U/	5		U/	5		U/	5	
Bromodichloromethane		100/80 (THM)	0.02a	ug/L	U/	5		U/	5		U/	5		U/	5		U/	5	
Bromoform		100/80 (THM)	0.2a	ug/L	U/	5		U/	5		U/	5		U/	5		U/	5	
Bromomethane (Methyl bromide)			9.8*	ug/L	U/	10		U/	10		U/	10		U/	10		U/	10	
2-Butanone (MEK)				ug/L	U/	10		U/	10		U/	10		U/	10		U/	10	
Carbon disulfide			700*	ug/L	U/	5		U/	5		U/	5		U/	5		U/	5	
Carbon tetrachloride		5	5	ug/L	U/	5		U/	5		U/	5		U/	5		U/	5	
Chlorobenzene (Monochlorobenzene)		100	100	ug/L	U/	5		U/	5		U/	5		U/	5		U/	5	
Chlorodibromomethane		100/80 (THM)	140*	ug/L	U/	5		U/	5		U/	5		U/	5		U/	5	
Chloroethane				ug/L	U/	10		U/	10		U/	10		U/	10		U/	10	
Chloroform		100/80 (THM)	0.02a	ug/L	U/	5		U/	5		U/	5		U/	5		U/	5	
Chloromethane				ug/L	U/	10		U/	10		U/	10		U/	10		U/	10	
1,1-Dichloroethane			700*	ug/L	U/	5		U/	5		U/	5		U/	5		U/	5	
1,2-Dichloroethane		5	5	ug/L	U/	5		U/	5		U/	5		U/	5		U/	5	
1,1-Dichloroethene		7	7	ug/L	U/	5		U/	5		U/	5		U/	5		U/	5	
cis-1,2-Dichloroethene		70	70	ug/L	U/	5		U/	5		U/	5		U/	5		U/	5	
trans-1,2-Dichloroethene		100	100	ug/L	U/	5		U/	5		U/	5		U/	5		U/	5	
1,2-Dichloropropane		5	5	ug/L	U/	5		U/	5		U/	5		U/	5		U/	5	
cis-1,3-Dichloropropene			1a (cis + trans)	ug/L	U/	5		U/	5		U/	5		U/	5		U/	5	
trans-1,3-Dichloropropene				ug/L	U/	5		U/	5		U/	5		U/	5		U/	5	
Ethyl benzene		700	700	ug/L	U/	5		U/	5		U/	5		U/	5		U/	5	
2-Hexanone (MBK)				ug/L	U/	10		U/	10		U/	10		U/	10		U/	10	
4-Methyl-2-pentanone (MIBK)				ug/L	U/	10		U/	10		U/	10		U/	10		U/	10	
Methylene chloride		5	5	ug/L	U/	5		U/	5		U/	5		U/	5		U/	5	
Styrene		100	100	ug/L	U/	5		U/	5		U/	5		U/	5		U/	5	
1,1,2,2-Tetrachloroethane				ug/L	U/	5		U/	5		U/	5		U/	5		U/	5	
Tetrachloroethene		5	5	ug/L	U/	5		U/	5		U/	5		U/	5		U/	5	
Toluene		1000	1000	ug/L	U/	5		U/	5		U/	5		U/	5		U/	5	
1,1,1-Trichloroethane		200	200	ug/L	U/	5		U/	5		U/	5		U/	5		U/	5	
1,1,2-Trichloroethane		5	5	ug/L	U/	5		U/	5		U/	5		U/	5		U/	5	
Trichloroethene		5	5	ug/L	U/	5		U/	5		U/	5		U/	5		U/	5	
Vinyl Acetate			7000*	ug/L	U/	10		U/	10		U/	10		U/	10		U/	10	
Vinyl Chloride		2	2	ug/L	U/	2		U/	2		U/	2		U/	2		U/	2	
m-Xylene				ug/L	U/	5		U/	5		U/	5		U/	5		U/	5	
o-Xylene				ug/L	U/	5		U/	5		U/	5		U/	5		U/	5	
p-Xylene				ug/L	U/	5		U/	5		U/	5		U/	5		U/	5	
SVOC																			
Phenol			100	mg/L	U/	0.01		U/	0.01		U/	0.01		U/	0.01		U/	0.01	
Inorganic																			
Chloride		250**	200	mg/L	99	/	5	72	/	5	62	/	5	88	/	5	37	/	5
Sulfate		500	400	mg/L	99	/	15	81	/	15	92	/	15	69	/	15	29	/	15
Total Dissolved Solids		500**	1200	mg/L	122	/	10	122	/	10	122	/	10	122	/	10	267	/	10

Table 3
Validated Analytical Results
Round 2, Long-Term Groundwater Monitoring Program
Blackwell Landfill, DuPage County, Illinois

Parameter	Sample Date	EPA MCLs	IEPA Class I Standards	Units	BW-GW-G147-910 12/11/01			BW-GW-TB01-10 12/11/01			BW-GW-TB02-10 12/13/01		
	Conc				LQ/DVQ	PQL	Conc	LQ/DVQ	PQL	Conc	LQ/DVQ	PQL	
VOC													
Acetone			700*	ug/L		U/	10		U/	10		U/	10
Benzene		5	5	ug/L		U/	5		U/	5		U/	5
Bromodichloromethane		100/80 (THM)	0.02a	ug/L		U/	5		U/	5		U/	5
Bromoform		100/80 (THM)	0.2a	ug/L		U/	5		U/	5		U/	5
Bromomethane (Methyl bromide)			9.8*	ug/L		U/	10		U/	10		U/	10
2-Butanone (MEK)				ug/L		U/	10		U/	10		U/	10
Carbon disulfide			700*	ug/L		U/	5		U/	5		U/	5
Carbon tetrachloride		5	5	ug/L		U/	5		U/	5		U/	5
Chlorobenzene (Monochlorobenzene)		100	100	ug/L		U/	5		U/	5		U/	5
Chlorodibromomethane		100/80 (THM)	140*	ug/L		U/	5		U/	5		U/	5
Chloroethane				ug/L		U/	10		U/	10		U/	10
Chloroform		100/80 (THM)	0.02a	ug/L		U/	5		U/	5		U/	5
Chloromethane				ug/L		U/	10		U/	10		U/	10
1,1-Dichloroethane			700*	ug/L		U/	5		U/	5		U/	5
1,2-Dichloroethane		5	5	ug/L		U/	5		U/	5		U/	5
1,1-Dichloroethene		7	7	ug/L		U/	5		U/	5		U/	5
cis-1,2-Dichloroethene		70	70	ug/L		U/	5		U/	5		U/	5
trans-1,2-Dichloroethene		100	100	ug/L		U/	5		U/	5		U/	5
1,2-Dichloropropane		5	5	ug/L		U/	5		U/	5		U/	5
cis-1,3-Dichloropropene			1a (cis + trans)	ug/L		U/	5		U/	5		U/	5
trans-1,3-Dichloropropene				ug/L		U/	5		U/	5		U/	5
Ethyl benzene		700	700	ug/L		U/	5		U/	5		U/	5
2-Hexanone (MBK)				ug/L		U/	10		U/	10		U/	10
4-Methyl-2-pentanone (MIBK)				ug/L		U/	10		U/	10		U/	10
Methylene chloride		5	5	ug/L		U/	5		U/	5		U/	5
Styrene		100	100	ug/L		U/	5		U/	5		U/	5
1,1,2,2-Tetrachloroethane				ug/L		U/	5		U/	5		U/	5
Tetrachloroethene		5	5	ug/L		U/	5		U/	5		U/	5
Toluene		1000	1000	ug/L		U/	5		U/	5		U/	5
1,1,1-Trichloroethane		200	200	ug/L		U/	5		U/	5		U/	5
1,1,2-Trichloroethane		5	5	ug/L		U/	5		U/	5		U/	5
Trichloroethene		5	5	ug/L		U/	5		U/	5		U/	5
Vinyl Acetate			7000*	ug/L		U/	10		U/	10		U/	10
Vinyl Chloride		2	2	ug/L		U/	2		U/	2		U/	2
m-Xylene				ug/L		U/	5		U/	5		U/	5
o-Xylene				ug/L		U/	5		U/	5		U/	5
p-Xylene				ug/L		U/	5		U/	5		U/	5
SVOC													
Phenol			100	mg/L		U/	0.01						
Inorganic													
Chloride		250**	200	mg/L	40	/	5						
Sulfate		500	400	mg/L	30	/	15						
Total Dissolved Solids		500**	1200	mg/L	269	/	10						

Table 3
Validated Analytical Results
Round 2, Long-Term Groundwater Monitoring Program
Blackwell Landfill, DuPage County, Illinois

NOTES:

Conc = concentration

LQ/DVQ = Lab Qualifiers/Data Validation Qualifiers

PQL = Practical Quantitation Limit

* not listed as standard in 620.410

** Secondary MCLs

a - Health Advisory Concentration equal to ADL for carcinogens

+ Action Level listed in Drinking Water Regulations

THM - Total for all THMs cannot exceed the 80ug/L level

PHA - Polyaromatic Hydrocarbon

Sample Label Identifiers:

FB - field blank

GW - groundwater

G107 - well identification

TB - trip blank

VB - volatile blank

SVB - semi-volatile blank

-01 - sample

-91 - duplicate sample

Qualifier Definitions:

U/ - Not detected

/U - Not detected, blank contamination

J/ - Estimated value

/UJ - Not detected, estimated detection limit

/J - Estimated value, data qualifier added

/R - Unusable, data qualifier added

S/ - Analysis performed using MSA

*/- Duplicate outside control limits

B/- Detected, but below CRDL (Inorganics only)

B/- Also detected in method blank (Organics only)

N/- Matrix spike outside control limits

Table 4
Summary of Detections in Monitoring Wells
Round 2, Long-Term Groundwater Monitoring Program
Blackwell Landfill, DuPage County, Illinois

Parameter	EPA MCLs	IEPA Class I Standards	Units	Outwash Detection			Bedrock Detection			Outwash Compliance			Bedrock Compliance		
				Detections	Range		Detections	Range		Detections	Range		Detections	Range	
					Min	Max		Min	Max		Min	Max		Min	Max
VOC															
cis-1,2-Dichloroethene	70	70	ug/L	4 / 6	5.1	10.9	0 / 2	nd	nd	0 / 2	nd	nd	0 / 2	nd	nd
Inorganic															
Chloride	250**	200	mg/L	6 / 6	5	99	2 / 2	25	88	2 / 2	15	40	2 / 2	62	72
Sulfate	500	400	mg/L	6 / 6	52	191	2 / 2	53	69	2 / 2	29	69	2 / 2	81	92
Total Dissolved Solids	500**	1200	mg/L	6 / 6	404	Exceeds either MCLs or IEPA GW standards	2 / 2	424	Exceeds either MCLs or IEPA GW standards	2 / 2	267	469	2 / 2	Exceeds either MCLs or IEPA GW standards	Exceeds either MCLs or IEPA GW standards

Notes:

* not listed as standard in 620.410:

** Secondary MCLs:

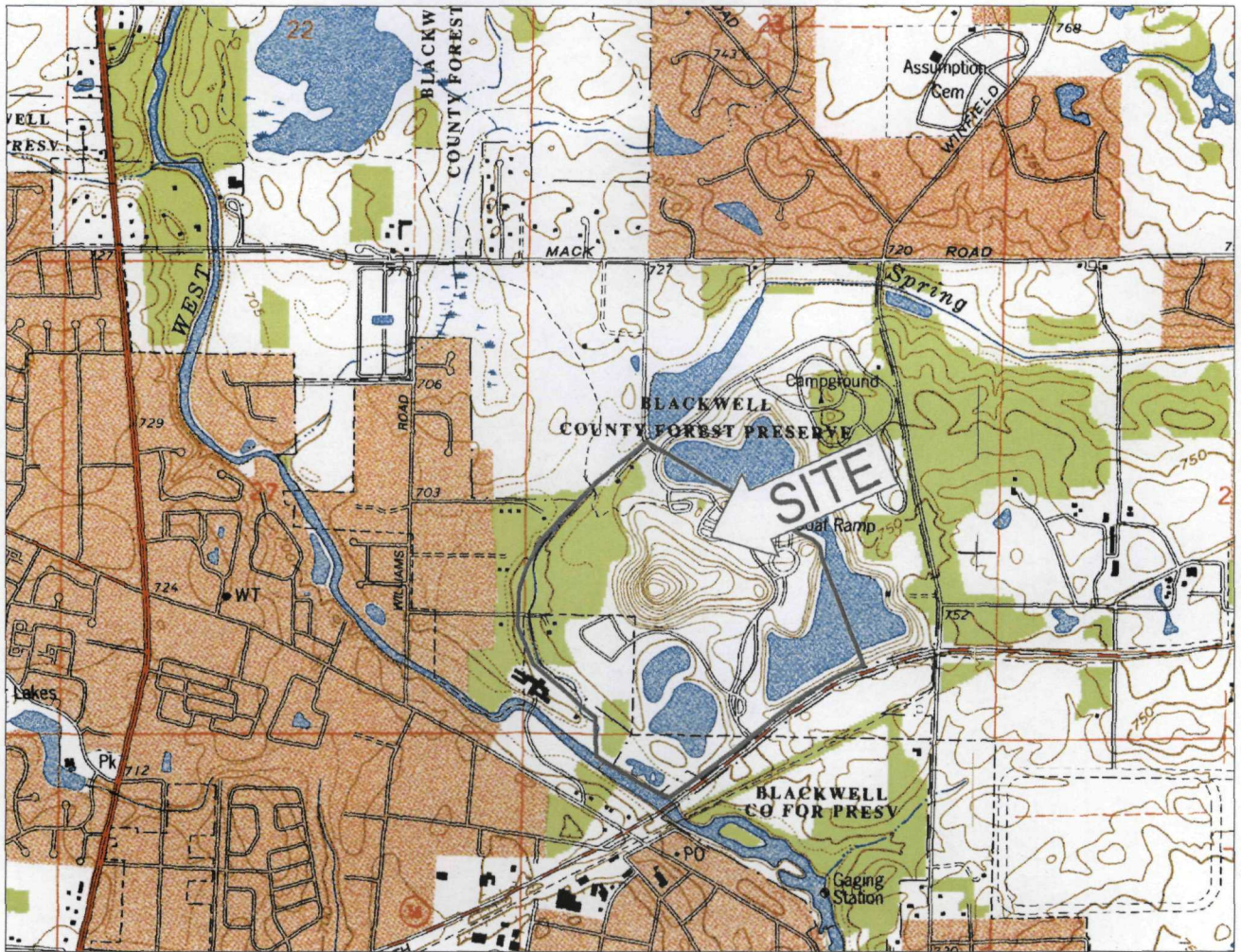
a - Health Advisory Concentration equal to ADL for carcinogens

+ Action Level listed in Drinking Water Regulations

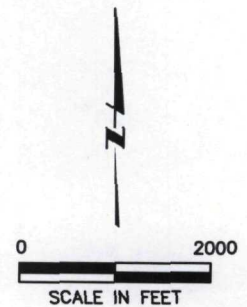
nd - no detections

Exceeds either MCLs or IEPA GW standards





BASE MAP DEVELOPED FROM THE
NAPERVILLE, ILLINOIS 7.5 MINUTE
U.S.G.S. TOPOGRAPHIC QUADRANGLE MAP
DATED: 1993



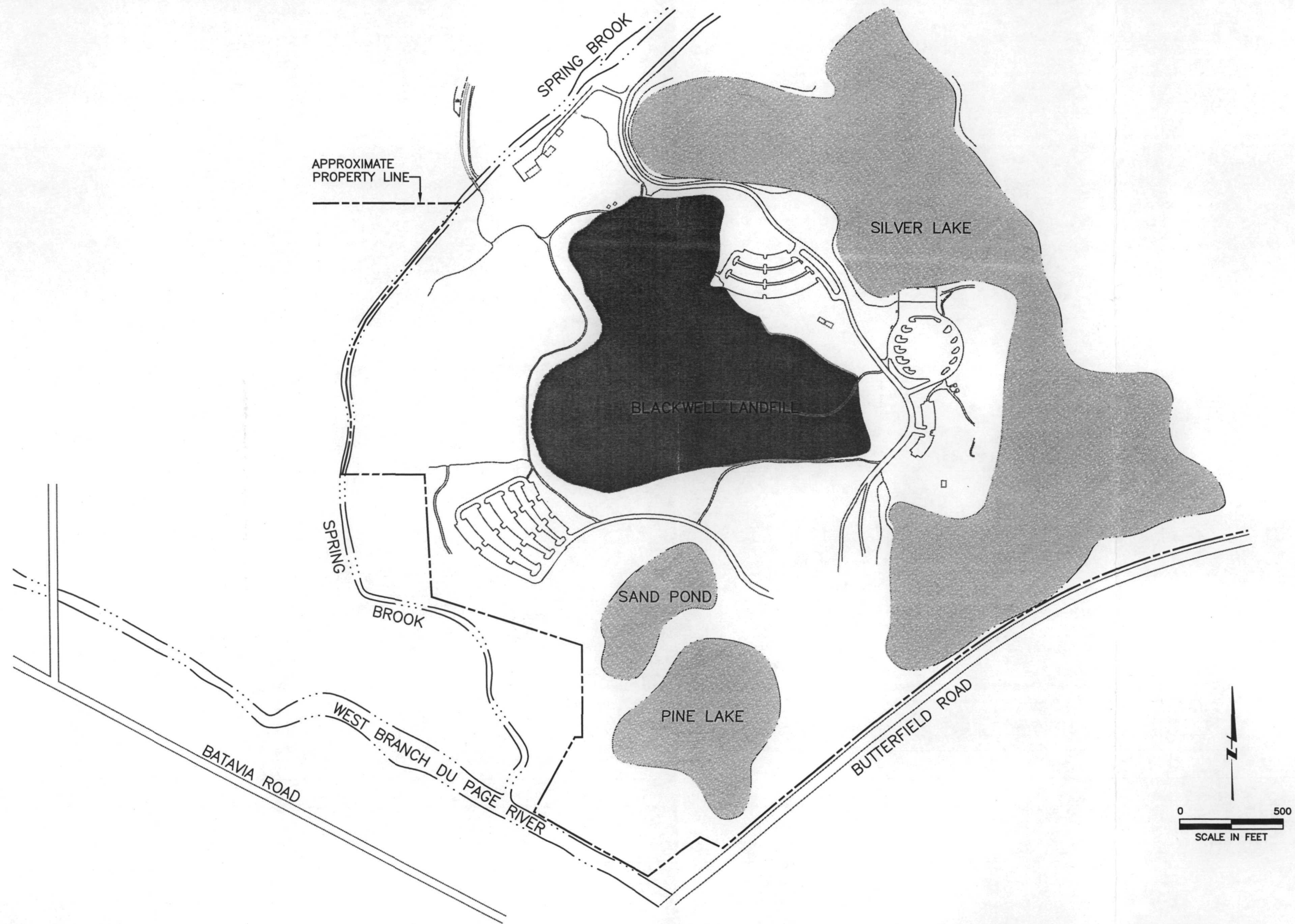
MONTGOMERY WATSON
Chicago, Illinois

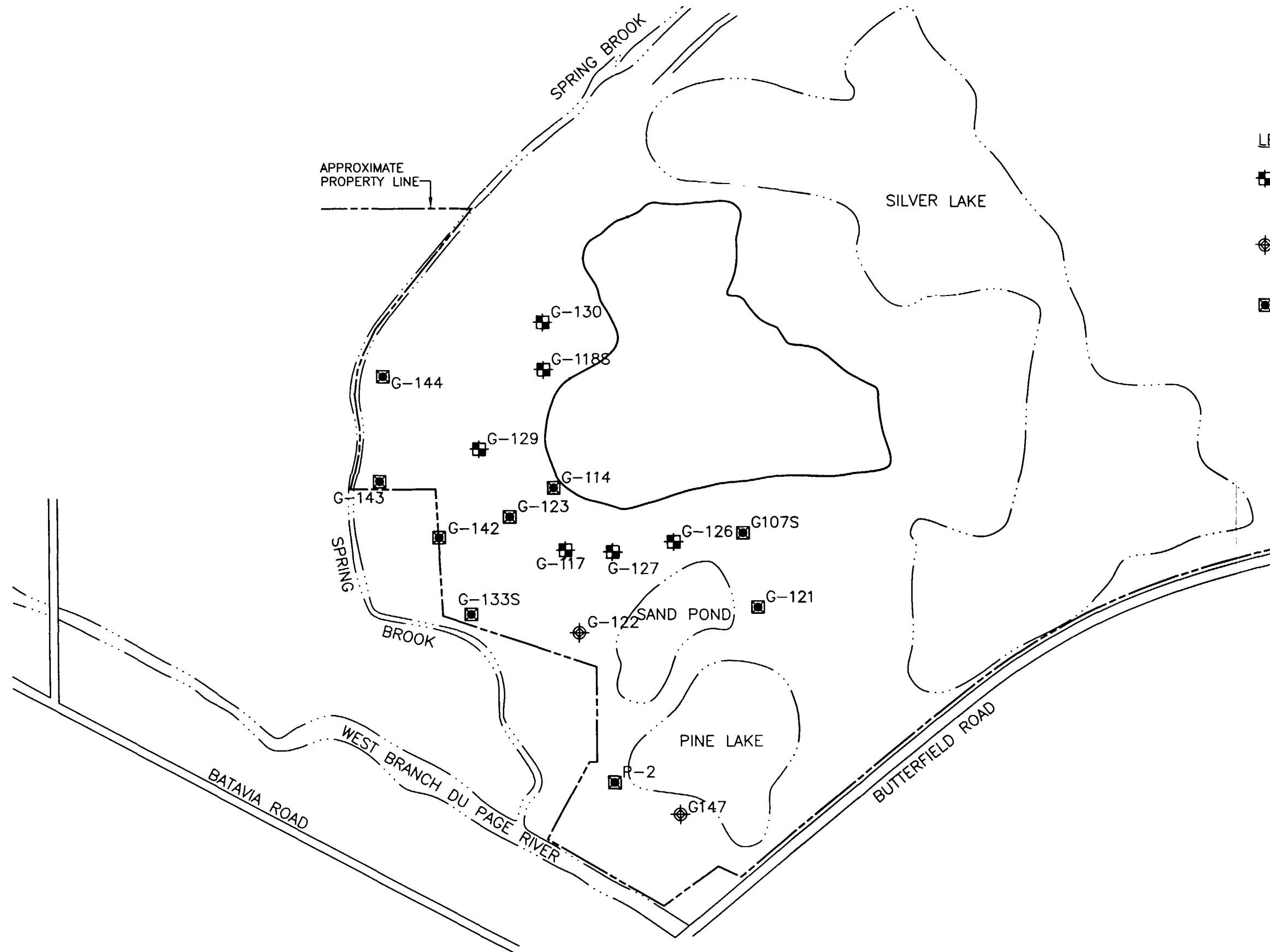
BLACKWELL LANDFILL NPL SITE
DUPAGE COUNTY, ILLINOIS

SITE LOCATION

FIGURE

1





LEGEND

- G-126 DETECTION MONITORING WELLS, LOCATED BETWEEN THE LANDFILL AND THE DOWNGRAIENT SITE BOUNDARY
- G-122 COMPLIANCE MONITORING WELLS, LOCATED ALONG THE DOWNGRAIENT SITE BOUNDARY
- P-2 OTHER MONITORING WELLS/PIEZOMETERS FOR WATER LEVEL MEASUREMENT ONLY



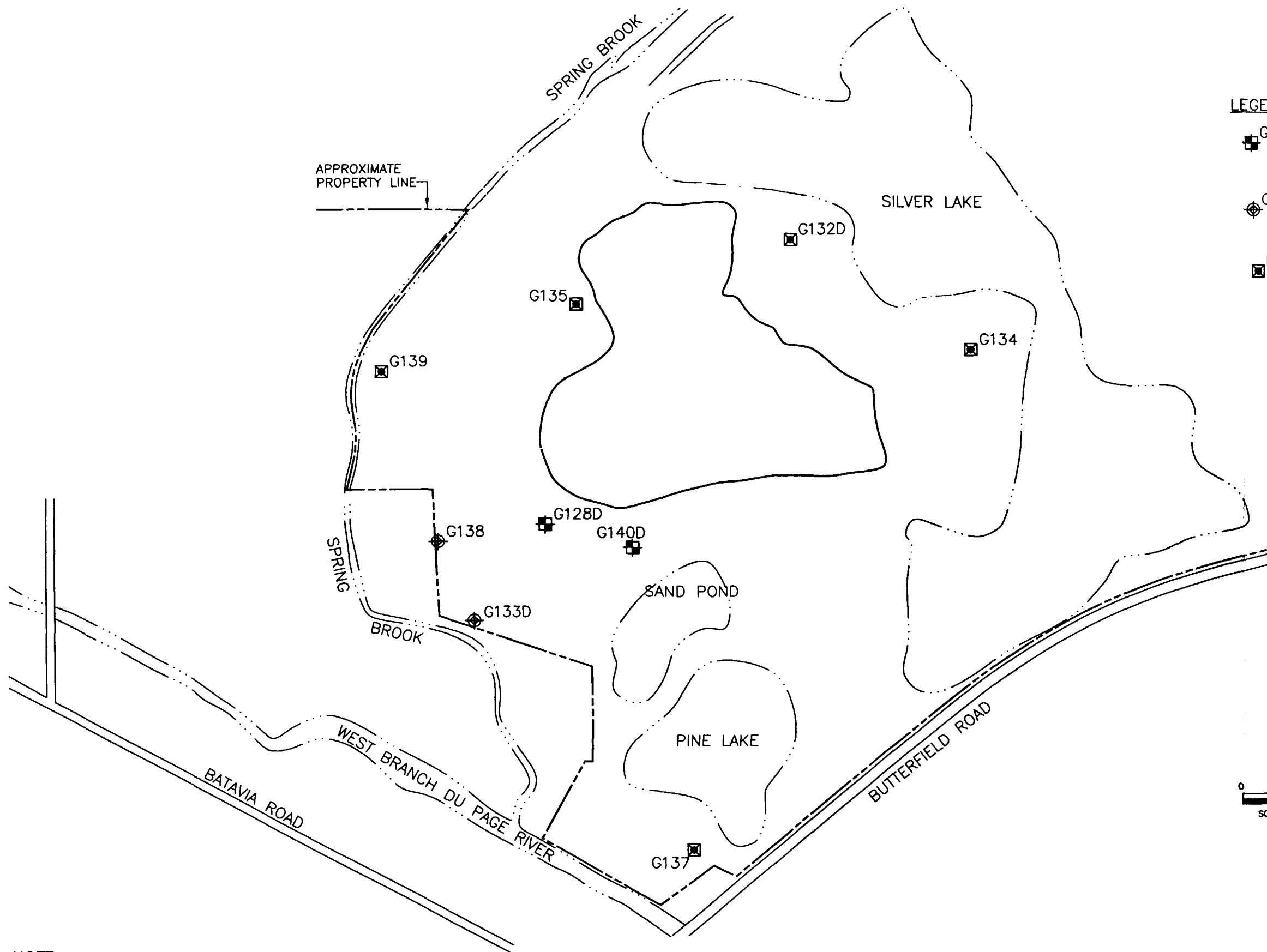
NOTE
 BASE MAP DEVELOPED FROM WARZYN INC. DRAWING NO. 6072100-B47, "GROUNDWATER MONITORING WELL SAMPLING LOCATION MAP", DATED JULY 28, 1994.






BLACKWELL LANDFILL NPL SITE
 DU PAGE COUNTY, ILLINOIS

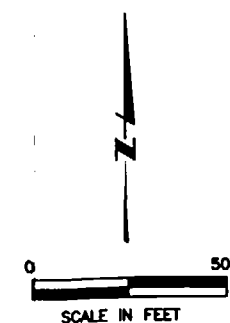
UPPER AQUIFER WELL AND
 PIEZOMETER LOCATIONS

FIGURE
 3



LEGEND

-  G135 DETECTION MONITORING WELLS, LOCATED BETWEEN THE LANDFILL AND THE DOWNGRADEMENT SITE BOUNDARY
-  G133D COMPLIANCE MONITORING WELLS, LOCATED ALONG THE DOWNGRADEMENT SITE BOUNDARY
-  P2 OTHER MONITORING WELLS/PIEZOMETERS FOR WATER LEVEL MEASUREMENT ONLY



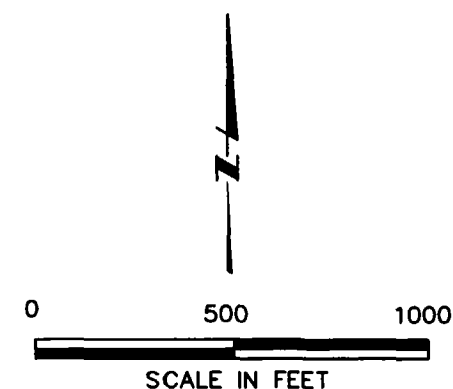
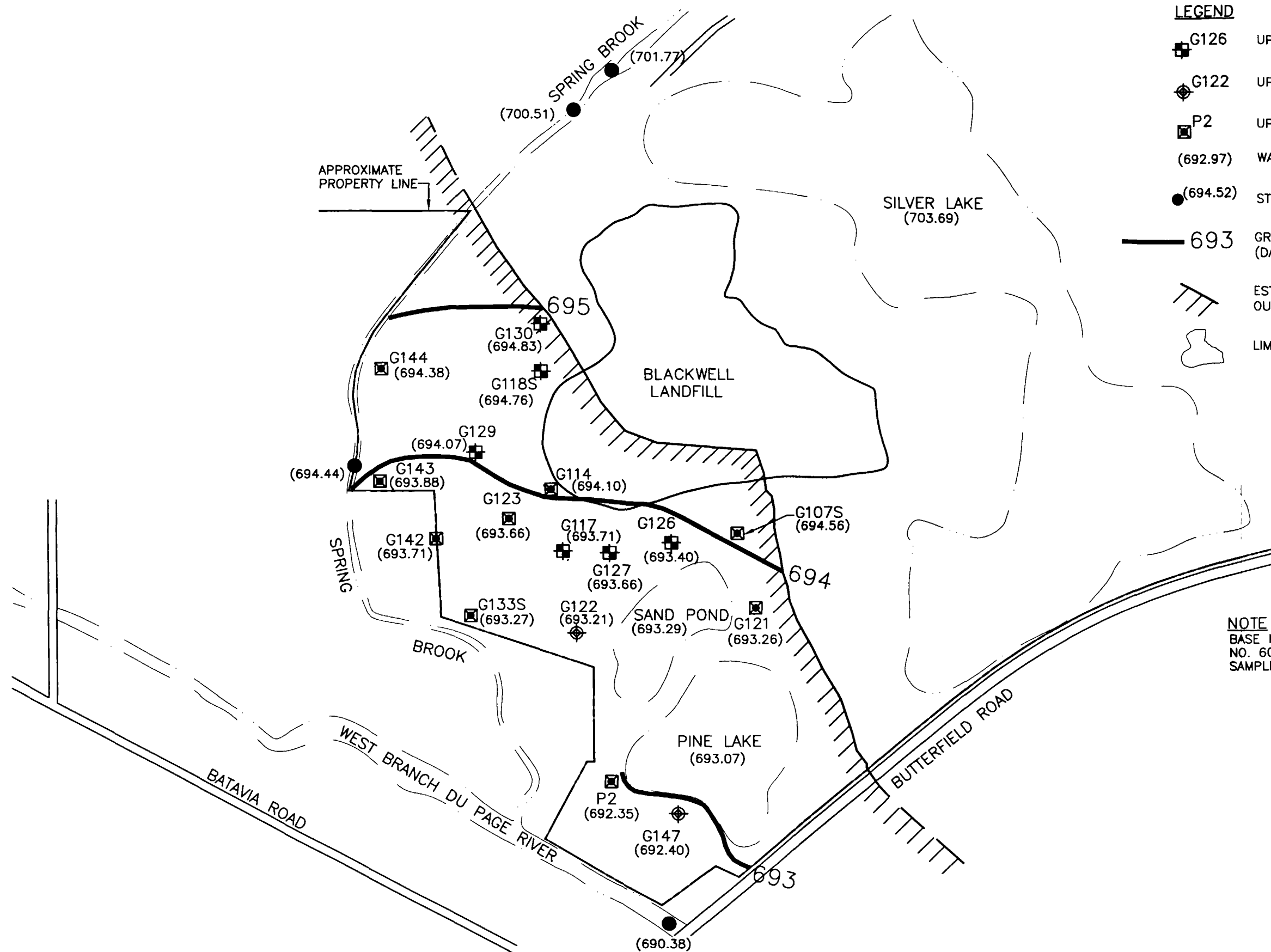
NOTE
 BASE MAP DEVELOPED FROM WARZYN INC. DRAWING NO. 6072100-B47, "GROUNDWATER MONITORING WELL SAMPLING LOCATION MAP", DATED JULY 28, 1994.



BLACKWELL LANDFILL NPL SITE
 DU PAGE COUNTY, ILLINOIS

BEDROCK AQUIFER
 WELL LOCATIONS

FIGURE
 4



SCALE
AS SHOWN

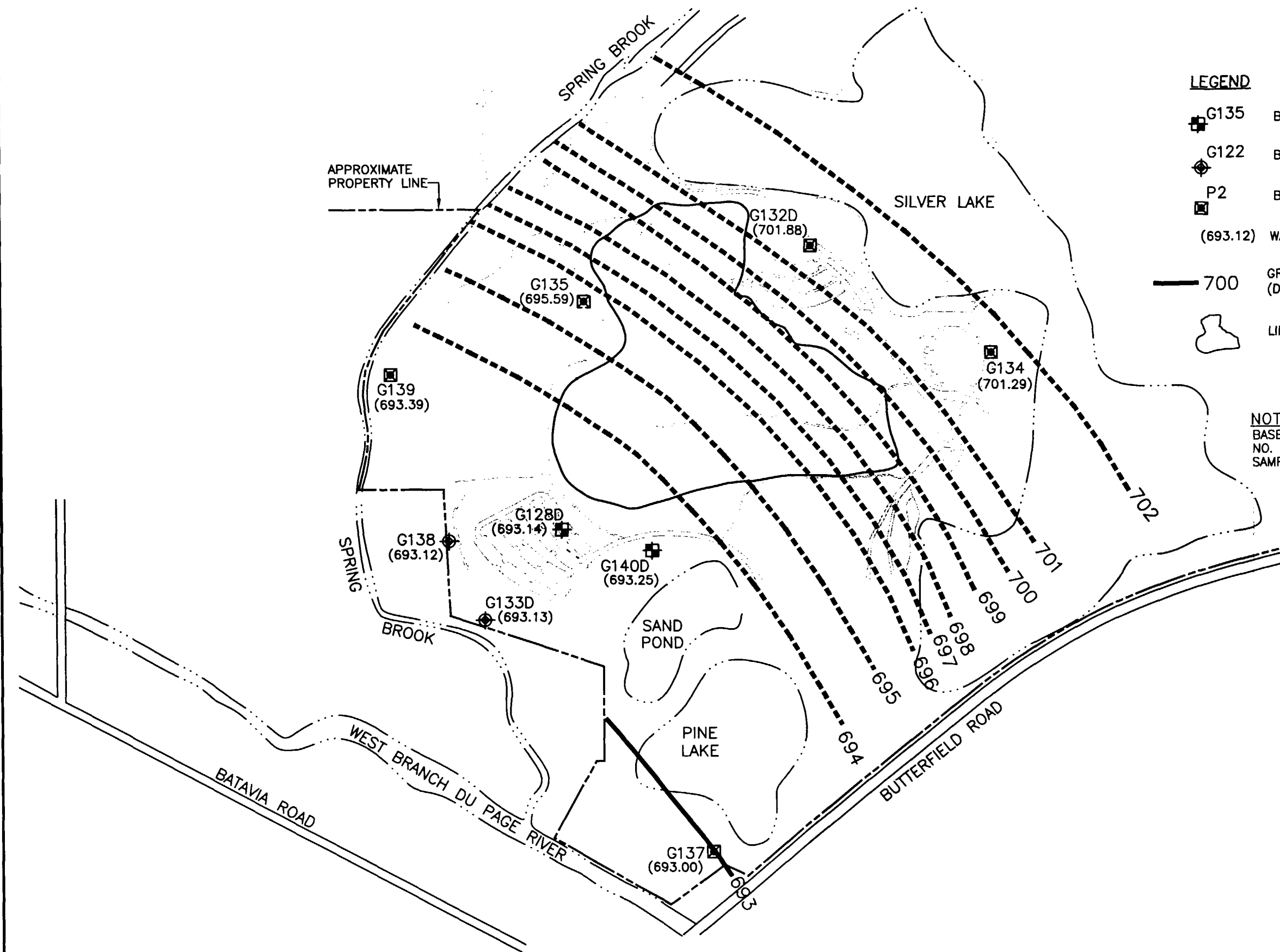


MONTGOMERY WATSON
Chicago, Illinois

BLACKWELL LANDFILL NPL SITE
DUPAGE COUNTY, ILLINOIS

UPPER AQUIFER WATER TABLE
MAP (DECEMBER 2001)

FIGURE
5



LEGEND

- G135 BEDROCK AQUIFER DETECTION WELLS
- G122 BEDROCK AQUIFER COMPLIANCE WELLS
- P2 BEDROCK AQUIFER WATER LEVEL WELLS
- (693.12) WATER LEVEL ELEVATIONS (ft msl) (DECEMBER 2001)

— 700 GROUNDWATER ELEVATION CONTOUR (DASHED WHERE INFERRED)

LIMITS OF REFUSE

NOTE

BASE MAP DEVELOPED FROM WARZYN INC. DRAWING NO. 6072100-B47, "GROUNDWATER MONITORING WELL SAMPLING LOCATION MAP", DATED JULY 28, 1994.

SCALE
AS SHOWN



MONTGOMERY WATSON
Chicago, Illinois

BLACKWELL LANDFILL NPL SITE
DUPAGE COUNTY, ILLINOIS

LOWER AQUIFER POTENTIOMETRIC
SURFACE MAP (DECEMBER 2001)

FIGURE
6